EVALUATING NEW DIFFUSE SOURCES AND NEW RECEPTORS FOR AIRNET COVERAGE

Purpose

This Air Quality Group procedure describes the criteria to be used in evaluating the need for additional Rad-NESHAP AIRNET compliance stations around new or modified diffuse emission sources of tritium and radioactive particles. It also addresses evaluations of potential new receptors.

Scope

This procedure applies to the individuals assigned to perform the "monthly" reviews of new or modified diffuse-emission radiation sources or new receptors to ensure sufficient Rad-NESHAP AIRNET stations are in place to provide environmental compliance monitoring coverage at LANL.

In this procedure

This procedure addresses the following major topics:

Hazard Control Plan

The hazard evaluation associated with this work is documented in HCP-ESH-17-Office Work.

Signatures

Prepared by: Joe Lochamy, ESH-17	Date: 12/4/01
Approved by: Craig Eberhart, Air Quality Monitoring Project Leader	Date: 12/7/2001
Approved by: Dave Fuehne, Rad-NESHAP Project Leader	Date: 12/10/2001
Approved by: Terry Morgan, QA Officer	Date: 12/13/01
Work authorized by: Jean Dewart, ESH-17 Acting Group Leader	Date: 12/13/01

01/16/02

CONTROLLED DOCUMENT

This copy is uncontrolled if no signatures are present or if the copy number stamp is black. Users are responsible for ensuring they work to the latest approved revision.

General information about this procedure

Attachments

This procedure has the following attachments:

Number	Attachment Title	No. of pages
1	Example Source Evaluation Memo	1
2	Worksheet for Evaluating New Sources for Potential New RAD-NESHAP AIRNET Stations	1
3	Worksheet for Evaluating New Receptors for Potential New RAD-NESHAP AIRNET Stations	1

History of revision

This table lists the revision history and effective dates of this procedure.

Revision	Date	Description Of Changes
0	12/19/01	New document.

Who requires training to this procedure?

The following personnel require training before implementing this procedure:

- ESH-17 personnel assigned to perform this procedure

Training method

The training method for this procedure is "**self-study**" (reading) and is documented in accordance with the procedure for training (ESH-17-024).

General information, continued

References

The following documents are referenced in this procedure:

- ESH-17-024, "Personnel Training"
- ESH-17-AIRNET, "Sampling and Analysis Plan for the Radiological Air Sampling Network (AIRNET)
- ESH-17-103, "Review of New or Modified Radioactive Air Emissions Sources"
- ESH-17-207, "Evaluation of AIRNET Sampler Sites Against Siting Criteria"
- LANL FFCA Compliance Plan, Supplement 2b, "Sampler Siting Analysis"
- "Diffuse Emissions Monitoring Along the Northern Boundary of LANL," ESH-17:01-032
- Letter from Steve Fong, DOE-LAAO, to George Browzowski, EPA, May 11, 2001

Note

Actions specified within this procedure, unless preceded with "should" or "may," are to be considered mandatory guidance (i.e., "shall").

Siting analysis of new or modified sources

Overview

The "Sampler Siting Analysis" in Supplement 2b of the LANL FFCA provides an analysis demonstrating that LANL diffuse emissions greater than 1700 meters from a receptor are accounted for by the original 17 AIRNET compliance stations in the FFCA. The "Northern Boundary Study" supports this conclusion for specific TAs. A May 11, 2001 letter to EPA from DOE describes the 1700-meter and the additional criteria used in this procedure.

The above criteria for locating AIRNET stations are summarized in the AIRNET Sampling and Analysis Plan (ESH-17-AIRNET). However, there needs to be a method for periodically reviewing new sources to determine if current RAD-NESHAP AIRNET coverage remains adequate to meet RAD-NESHAP requirements. This part of the procedure describes the evaluation that will be done during "monthly" reviews of new or modified diffuse radioactive sources to assure coverage complies with requirements.

Steps to perform siting analysis

To perform the siting analysis, do the following steps:

Step	Action
1	On approximately a monthly basis, obtain a listing, from the ESH-17 New Source Review (NSR) Project staff, of ESH-IDs which have been entered or updated during the month and which are identified as having the "rad concerns."
2	Use the NSR database, NSR paper records, scale maps, contact interviews, and any other information sources or tools as needed to "disqualify" entries from further analysis. "Disqualified" entries consist of any entries that are *obviously more than 1700 meters from any residence, school, business, or office; consist only of sealed source or direct radiation operations; are not diffuse (i.e., are "stacked" or accounted for by the radioactive material usage survey), or other conditions that would disqualify the entry from further analysis. *TAs such as 6, 8, 9, 22, 11, 14,15, 16, 18, 28, 37, 33, 39, 40, 49, 51, 67, 69, and 70 are obviously over 1700 meters from any receptor sites. Most of the operational areas of TAs 36, 54, and 68 are beyond the 1700-meter cut off.
3	Enter the explanations for these "disqualified" sources in a memo similar to the suggested example in Attachment 1.

Steps continued on next page.

Siting analysis of new or modified sources, continued

Step	Action
4	For all items that can not be directly "disqualified," put an asterisk (*) or other identifying mark next to its ESH ID in the memo and prepare an evaluation for each such source using the worksheet in Attachment 2 (or an equivalent alternative) to document your analysis. If one or more of the criteria (>1700-meters, adequate existing samplers, or <0.1-mrem) are known to disqualify the source from further analysis, it is not necessary to complete the *entire* worksheet for all evaluation factors. Rather, an evaluation documenting the disqualifying criterion is sufficient. As needed, use tools such as scale maps, meteorological sector overlays, CAP88 or previously derived conservative LANL dose factors, Rad-NESHAP Appendix D emission factors, professional judgment, and other tools to evaluate the sources against the worksheet criteria.
5	When the need for new sampler(s) is identified, visit the site to determine where samplers can be placed. Follow procedure ESH-17-207, "Evaluation of AIRNET Sampler Sites Against Siting Criteria" in selecting the location.
6	Write up the analysis in sufficient detail to fully describe the data used and the decisions made.
7	Obtain a review of the analysis by a qualified individual in the group.
8	Place a copy of the siting analysis memo and worksheet(s) in the AIRNET records with copies to applicable individuals such as those shown in Attachment 1.

Analysis of new receptors

Overview

Besides reviewing new diffuse sources, there also needs to be a method for periodically reviewing **newly identified diffuse-emission receptors** to determine if current RAD-NESHAP AIRNET coverage is remains adequate to meet RAD-NESHAP requirements. This part of the procedure describes the evaluation that will be done as new receptors are identified assure coverage complies with requirements.

Steps to perform receptor analysis

To perform the receptor analysis, do the following steps:

Step	Action
1	As data become available, by numerous means, regarding potential new receptors (such as LANL land being transferred to public use, new housing subdivisions, or new businesses in previously unpopulated areas), evaluate the receptor(s) using the worksheet in Attachment 3 (or an equivalent alternative) to document your analysis.
2	When the need for new sampler(s) is identified (by new receptors meeting the dose criteria), visit the site to determine where sampler(s) can be placed. Follow procedure ESH-17-207, "Evaluation of AIRNET Sampler Sites Against Siting Criteria" in selecting the location.
3	Write up the analysis in sufficient detail to fully describe the data used and the decisions made.
4	Obtain a review of the analysis by a qualified individual in the group.
5	Place a copy of the siting analysis in the AIRNET records with copies to appropriate individuals such as those shown in Attachment 1.

Records resulting from this procedure

Records

The following records generated as a result of this procedure are to be submitted **within 2 weeks** as records to the records coordinator:

- documentation (e.g., attachment 1 or attachment 2) sufficient to demonstrate the evaluation and determination made

Los Alamos
NATIONAL LABORATORY
memorandum
Environment, Safety, and Health Division
ESH-17 Air Quality Group

To/MS: Distribution
From/MS: Joe Lochamy, ESH-17, J978
Peer review by/MS: Keith Jacobson, ESH-17, J978
Phone/FAX: 5-8855/5-8858
Symbol: ESH-17:01-
Date: September 17, 2001

EXAMPLE

Review of New Sources for Potential NESHAP AIRNET Station Siting—June 2001

I have reviewed the following new sources entered or updated in the New Source Review database during June 2001. These new sources were flagged in the database as possibly having radioactive emissions.

ESH ID #	Location	Recommended Action
000342	TA-50-1	Stacked. No further action.
*000343	TA-50-1/2	*May* be stacked but DB dose is 5.2E-3 mrem. No further action.
*000349	TA-54-G/L	Samplers in applicable sectors. No further action.
009959	TA-48-45	Kr-85 only. See ESH-17:01-398. No further action.
010118	TA-21-Var	**Insufficient characterization info. Lochamy to follow up.**
010122	TA-35-27	Sealed sources only. No further action.
010124	TA-54-242	Envtl levels only. No known contamination. No further action.
010128	TA-16	>1700 m. No further action.
010132	TA-21	**Insufficient characterization info. Lochamy to follow up.**
*980225	TA-3-105	Char. Rpt data show >0.1 mrem not possible. No further action.
990013	TA-50-1	Stacked. No further action.

Any **diffuse** source above determined to be within 1700 meters of a populated area will be further evaluated according to procedure ESH-17-238 (in draft). The ESH IDs marked above with an asterisk (*) were evaluated per that procedure. Worksheet(s) attached. No new AIRNET stations are required.

JL:db

Attachment

Distribution:
Jean Dewart, ESH-17, J978
Dave Fuehne, ESH-17, J978
Scott Miller, ESH-17, J978
Jessica Trujillo, ESH-17, J978

Cy:
ESH-17 File
AIRNET NESHAP Sampler Siting File

WORKSHEET FOR EVALUATING NEW SOURCES FOR POTENTIAL NEW RAD-NESHAP AIRNET STATIONS

This form is from ESH-17-238

Source ESH ID : _____ Evaluation Date: _____

Notes (Attach additional pages and drawings as needed):

_____

1. CRITERION: Determine if the distance from the nearest receptor to the source is greater than 1700 meters. If so, the criterion is **satisfied**; go to #7 below: *(However, you may continue if there are special circumstances that would suggest that this 1700-meter rule does not apply.)*

Notes: _____

2. Select the receptor(s) likely to receive the highest dose from the source. Overlay the source with a sector grid. Mark the sectors enclosing the receptor(s) and the two adjacent sectors.

Notes: _____

3. Select an appropriate place near the receptor(s) where a new AIRNET station *would* be located, if needed.

Notes: _____

4. Measure the ½-sector width at the potential AIRNET location.

Notes: _____

5. CRITERION: Determine if an existing AIRNET station is within ½ sector (or 100 m, whichever is larger) in any direction (even if in a different sector) from the proposed AIRNET location. If so, the criterion is **satisfied**; go to #7 below:

Notes: _____

6. CRITERION: Determine if the total H-3/particle diffuse emissions dose at the selected receptor is likely to be *less* than 0.1 mrem/yr. If so, the criterion is **satisfied**; go to #7 below.

Notes: _____

7. If any one of the criteria in Steps 1, 5, and 6 above is satisfied, no new AIRNET sampler is required at the proposed location(s).

Decision:_____

8. If Step 7 requires a new sampler, determine if the nearest receptor in an adjacent sector is likely to exceed 50% of the dose in Step 6 (where Step 6 is over 0.1 mrem). If so, AND there is **not** an existing sampler within ½ sector (or 100 meters, if larger) in any direction from the adjacent-sector receptor location, THEN, an AIRNET sampler is also required in the adjacent sector.

Decision:_____

Evaluated by:

_____ _____ _____/_____/_____
Signature Print name Date

Reviewed by:

_____ _____ _____/_____/_____
Signature Print name Date

Sample

WORKSHEET FOR EVALUATING NEW RECEPTORS FOR POTENTIAL NEW RAD-NESHAP AIRNET STATIONS

This form is from ESH-17-238

Receptor ID: _____ Evaluation Date: _____

Notes (Attach additional pages and drawings as needed):

_____

1. Select the closest *major* diffuse (H-3/particle only) source to the receptor.

Notes: _____

2. Overlay the selected diffuse source with a sector grid and mark the sector enclosing the receptor and the two adjacent sectors.

Notes: _____

3. Select an appropriate place near the receptor where a new AIRNET station *would* be located, if needed.

Notes: _____

4. Measure the ½-sector width at the potential AIRNET location.

Notes: _____

5. CRITERION: Determine if an existing AIRNET station is within ½ sector (or 100 m, whichever is larger) in any direction (even if in a different sector) from the proposed AIRNET location. If so, the criterion is **satisfied**; go to #7 below

Notes: _____

6. CRITERION: Determine if the total H-3/particle diffuse emissions dose at the receptor is likely to be *less* than 0.1 mrem/yr. If so, the criterion is **satisfied**; go to #7 below.

Notes: _____

_____

7. If either of the criteria in Steps 5 and 6 above is satisfied, no new AIRNET sampler is required at the proposed location.

Decision:_____

8. Determine if the nearest receptor in an adjacent sector is likely to exceed 50% of the dose in Step 6 (where Step 6 is over 0.1 mrem). If so, AND there is **not** an existing sampler within ½ sector (or 100 meters, if larger) in any direction from the adjacent-sector receptor location, THEN, an AIRNET sampler is also required in the adjacent sector.

Decision:_____

Evaluated by:

_____ _____ _____/_____/_____

Signature Print name Date

Reviewed by:

_____ _____ _____/_____/_____

Signature Print name Date

Sample

WORKSHEET FOR EVALUATING NEW SOURCES FOR POTENTIAL NEW RAD-NESHAP AIRNET STATIONS

This form is from ESH-17-238

Source ESH ID : _____ Evaluation Date: _____

Notes (Attach additional pages and drawings as needed):

_____

1. CRITERION: Determine if the distance from the nearest receptor to the source is greater than 1700 meters. If so, the criterion is **satisfied**; go to #7 below: *(However, you may continue if there are special circumstances that would suggest that this 1700-meter rule does not apply.)*

Notes: _____

2. Select the receptor(s) likely to receive the highest dose from the source. Overlay the source with a sector grid. Mark the sectors enclosing the receptor(s) and the two adjacent sectors.

Notes: _____

3. Select an appropriate place near the receptor(s) where a new AIRNET station *would* be located, if needed.

Notes: _____

4. Measure the ½-sector width at the potential AIRNET location.

Notes: _____

5. CRITERION: Determine if an existing AIRNET station is within ½ sector (or 100 m, whichever is larger) in any direction (even if in a different sector) from the proposed AIRNET location. If so, the criterion is **satisfied**; go to #7 below:

Notes: _____

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Notes: _____

7. If any one of the criteria in Steps 1, 5, and 6 above is satisfied, no new AIRNET sampler is required at the proposed location(s).

Decision:_____

8. If Step 7 requires a new sampler, determine if the nearest receptor in an adjacent sector is likely to exceed 50% of the dose in Step 6 (where Step 6 is over 0.1 mrem). If so, AND there is **not** an existing sampler within ½ sector (or 100 meters, if larger) in any direction from the adjacent-sector receptor location, THEN, an AIRNET sampler is also required in the adjacent sector.

Decision:_____

Evaluated by:

_____	_____	_____/_____/_____
Signature	Print name	Date

Reviewed by:

_____	_____	_____/_____/_____
Signature	Print name	Date

WORKSHEET FOR EVALUATING NEW RECEPTORS FOR POTENTIAL NEW RAD-NESHAP AIRNET STATIONS

This form is from ESH-17-238

Receptor ID: _____ Evaluation Date: _____

Notes (Attach additional pages and drawings as needed):

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1. Select the closest *major* diffuse (H-3/particle only) source to the receptor.

Notes: _____

2. Overlay the selected diffuse source with a sector grid and mark the sector enclosing the receptor and the two adjacent sectors.

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3. Select an appropriate place near the receptor where a new AIRNET station *would* be located, if needed.

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Notes: _____

_____

7. If either of the criteria in Steps 5 and 6 above is satisfied, no new AIRNET sampler is required at the proposed location.

Decision:_____

8. Determine if the nearest receptor in an adjacent sector is likely to exceed 50% of the dose in Step 6 (where Step 6 is over 0.1 mrem). If so, AND there is **not** an existing sampler within ½ sector (or 100 meters, if larger) in any direction from the adjacent-sector receptor location, THEN, an AIRNET sampler is also required in the adjacent sector.

Decision:_____

Evaluated by:

_____ _____ _____/_____/_____

Signature Print name Date

Reviewed by:

_____ _____ _____/_____/_____

Signature Print name Date